

Meeting: 999, Nashville, Tennessee, SS 12A, Special Session on Biomathematics

999-92-53

Leonid G. Hanin* (hanin@isu.edu), Department of Mathematics, Idaho State University, Pocatello, ID 83209-8085. *Distribution of the Number of Clonogenic Tumor Cells Surviving Fractionated Radiation.*

We solve, under realistic biological assumptions, the following long-standing problem: To find the distribution of the number, N , of clonogenic tumor cells surviving a given arbitrary schedule of fractionated radiation. We show that the distribution of the random variable N at any time t after treatment belongs to the class of generalized negative binomial distributions, find an explicit computationally feasible formula for the distribution in question, and identify its limiting forms. In particular, for $t = 0$, the limiting distribution turns out to be Poisson, and an estimate of the rate of convergence in the total variation metric similar to the classical Law of Rare Events is obtained. (Received July 27, 2004)